tunity is given for his very essential physical development.

The first years of the American college are still in the nature of preparation for his special line of study; thus the transition from a condition of dependence in the preparatory school to one of independence in the higher school is a gradual one. Much stress is laid by the author upon the American system of supervision of the students' work as compared with the German system of complete freedom. The advantages of the American method are evident—that many students are guarded against mistakes which would entail serious consequences. Contrasted to this, the German system suddenly throws the student wholly upon his own responsibility—upon entrance into the university his choice of studies is unrestricted, and he takes no examination until his final one, when he deems himself prepared to try for the degree of 'doctor' from the university. The German contends that his system possesses the advantage that those who do not make the proper use of the freedom accorded to them will sooner or later fall out, so that only those will reach the goal who properly understand the privileges and duties of the students' freedom. This argument, however, presupposes that the student already has that which he must first acquire. In America, the same goal is striven for, but with fewer losses, in that the transition to the condition of independence is made gradual.

The difference in the ideals of education in the two countries may be summed up in the following: In America the aim of the higher education is to increase the efficiency of the average man; while in Germany the stress is laid upon bringing the best to the highest development. The author seems to reach the conclusion that due precaution is exercised in America to prevent the invasion of the less diligent into the ranks of the learned professions, while, at the same time, pains are taken to develop the less gifted, who are, on this account, the more in need of education.

The author discusses at some length the matters of state and private schools, the organization of instruction, the cost of instruction and scholarships, athletics and the love and loyalty of the alumni of a school for their alma mater. Many matters of interest are treated which can not be touched upon in this review. The author has dealt very lightly with our failings and has devoted himself chiefly to pointing out to his countrymen, with whom education is an established science, that which has been attained in a country where education is still in the state of development. It is a matter of interest to learn those points in our system which are deemed commendable, or worthy of study, by a student trained in the old world educational ideals. This work is of additional interest as treating the subject especially from the viewpoint of education in the exact natural sciences; previous writers in the main having treated the subject in its relation to general culture.

Arthur A. Blanchard

SCIENTIFIC JOURNALS AND ARTICLES

The Journal of Geology for November–December has for its frontispiece a reproduction of a photograph of the late Professor Israel C. Russel. The first article is a sketch of his life by G. K. Gilbert. Following this is an article by James Geikie, "On the so-called 'Postglacial Formations' of Scotland." In this are discussed geographical and climatic changes, from evidence gathered in the Scottish mountains. As the most representative deposits known as 'postglacial,' he speaks of 'raised beaches, estuarine and fluviatile terraces, lacustrine alluvia and peat mosses.' He considers the term 'postglacial' misleading, because glacial conditions disappeared from different regions at widely different times. The following succession of events is given: (1) after the disappearance of district ice-sheets and mountain-valley glaciers, the sea retreated considerably, and the climate became milder; (2) subsidence and return to cold climate; (3) retreat of sea beyond present coast line and return to dry genial conditions; (4) partial subsidence with change of climate to cold and wet; (5) final retreat of sea to present level. The next article is on 'The Three Paleozoic Ice Ages of South Africa,' by Ernest H. L. Schwarz. Evidence is offered

of three ice ages at widely separated times. The Permian glaciation is already fairly well known. Of the other two, one is probably Devonian, the other Archean. The field evidence is said to be convincing. 'The Texture of Igneous Rocks' is taken up by Whitman Cross, J. P. Iddings, L. V. Pirsson and H. S. Washington. They attempt to make the classification according to textures more systematic, and to get rid of the prevalent vagueness and inexactness. Terms with exact meanings are proposed and the whole put into systematic shape. 'Natural Mounds' is the title of an article by Maurius R. Campbell. The mounds occur on flat surfaces and are low and broad, and very symmetrical. They vary from 10 to 140 feet in diameter and from a few inches to 5 or 6 feet in height. They are of very wide occurrence. Various hypotheses of origin have been offered, but many of them have little foundation. Of eleven possible modes of origin the writer eliminates all but the one which ascribes them to burrowing animals—ants or rodents. The subject of 'Rock Folds due to Weathering' is taken up by the same author. He shows how great the expansion is in ordinary weathering and how this often forces the surface rocks to buckle. 'The Geology of the Lower Amazon Region' is based upon Katzer's work and that of some others and was written by Charles Schuchert. As the title indicates, it is a discussion of the general geology and stratigraphy of the region and adds considerably to our knowledge of Brazil. The Devonian and Carboniferous are discussed in considerable detail, and lists of fossils given for correlation. The last article is by George Davis Louderback on 'The Relation of Radioactivity to Vulcanism.' The important bearing of the recently developed knowledge of radioactivity on the problems of the geologist is shown and discussed in some detail. The writer believes that while much of the interior heat of the earth may be explained by radioactivity, the special phenomena of volcanoes may not be so explained.

The Journal of Comparative Neurology and Psychology for November contains the following articles: 'The Mode of Connection of the Medullated Nerve Fiber with its Cell Body,' by Oliver S. Strong. A plate is given illustrating the form of the axone between the cell body and the medullary sheath. 'On the Centers for Taste and Touch in the Medulla Oblongata of Fishes,' by C. Judson Herrick. Fishes like the catfish which detect their food by the simultaneous action of both taste and touch in the barblets and outer skin offer an interesting problem in the examination of the centers of correlation within the brain for these diverse sensory tracts coming from the same cutaneous areas. The analysis of these centers in the medulla oblongata of Ameiurus shows that the gustatory nerves from visceral surfaces effect the usual secondary connections with the visceral musculature, but those gustatory nerves which come from the outer skin make their secondary connections with the primary tactile centers in the funicular nuclei, so that a common efferent path from the latter correlation center serves for both senses. 'Modifiability of Behavior in *Hydroides dianthus* V,' by Ada Watterson Yerkes. The experiments show that this annelid worm readily learns by experience. Two short papers on the 'Behavior of *Gonionemus*' are contributed by Max Morse and Robert M. Yerkes respectively. An editorial on the relation of the newer work of the American school of comparative neurologists to human neurology and a few book reviews complete the number.

SOCIETIES AND ACADEMIES

THE GEOLOGICAL SOCIETY OF WASHINGTON

AT the 182d meeting of the society on November 14, Mr. F. E. Wright presented informally the results of a comparative study of various methods in use for determining the relative quantities of mineral constituents in rocks.

The meeting was devoted to an account of the Tenth International Geologic Congress, held in Mexico City, September 7 to 14, 1906.

Mr. GEORGE OTIS SMITH described 'The Excursion before the Congress.'

Mr. S. F. EMMONS: 'The Excursion to Jorullo.'

Mr. G. F. BECKER: 'The Sessions in Mexico City.'

Mr. T. W. STANTON: 'The Excursions after the Congress.'